

# DENVER WATER 2003

## Water Quality REPORT



DENVER WATER

Denver Water vigilantly safeguards its mountain water supplies, and before the water reaches your tap, we carefully filter and treat it. This brochure compiled from data collected throughout 2002 is a look at how Denver Water continues to provide you with a safe, dependable water supply.

Visit us online at [www.denverwater.org](http://www.denverwater.org)

# Quality checks

**ALL DRINKING WATER**, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.

Immunocompromised individuals – such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, those with HIV-AIDS or other immune system disorders, and some elderly and infants – can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency and the U.S. Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *cryptosporidium* and microbiological contaminants, call the EPA

**Safe Drinking Water Hotline** at 1-800-426-4791.

**SOURCES OF DRINKING WATER** – both tap and bottled water – include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material and can pick up substances resulting from the presence of animals or from human activity. Contaminants that might be present in source water include:

**MICROBIAL CONTAMINANTS**, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

**INORGANIC CONTAMINANTS**, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

**PESTICIDES AND HERBICIDES** that may come from a variety of sources, such as agriculture, urban stormwater runoff and residential uses.

**ORGANIC CHEMICAL CONTAMINANTS**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban stormwater runoff and septic systems.

**RADIOACTIVE CONTAMINANTS**, which can be naturally occurring

or be the result of oil and gas production and mining activities.

## THIS REPORT is

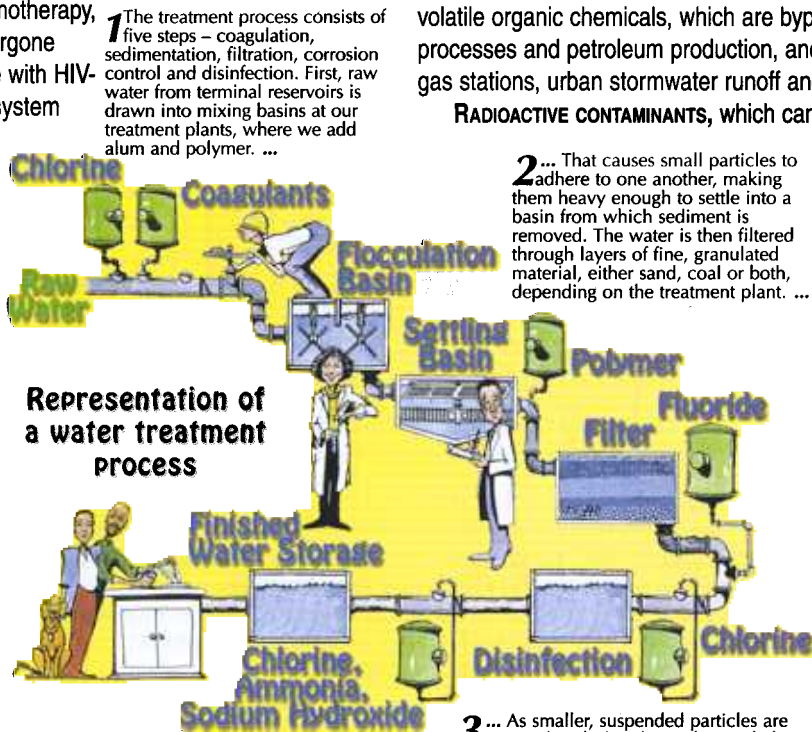
Denver Water's annual summary of where your water comes from, what's in it, and how we treat, protect and deliver drinking water. We've also compared our test results with federal and state regulations, and we're pleased to report that Denver Water's record remains unblemished.

We've never violated a health standard, in spite of

wildfires last year and the drought. Since inception, the department has been treating and testing quality of its water, and our findings always have been available to the public.

Our Water Quality Lab keeps an eye on quality through both its field staff and data sent from 15 automated monitoring stations in the metro area. The Lab throughout 2002 conducted 39,859 microbiological and chemical tests from 11,788 samples. Denver Water treated 75 billion gallons of water last year, an average of 206 million gallons daily.

*Esta información es importante. Si no la pueden leer, necesitan que alguien se la pueda traducir. Si quiere esta información en español, llame al 303-628-6126.*



**1** The treatment process consists of five steps – coagulation, sedimentation, filtration, corrosion control and disinfection. First, raw water from terminal reservoirs is drawn into mixing basins at our treatment plants, where we add alum and polymer. ...

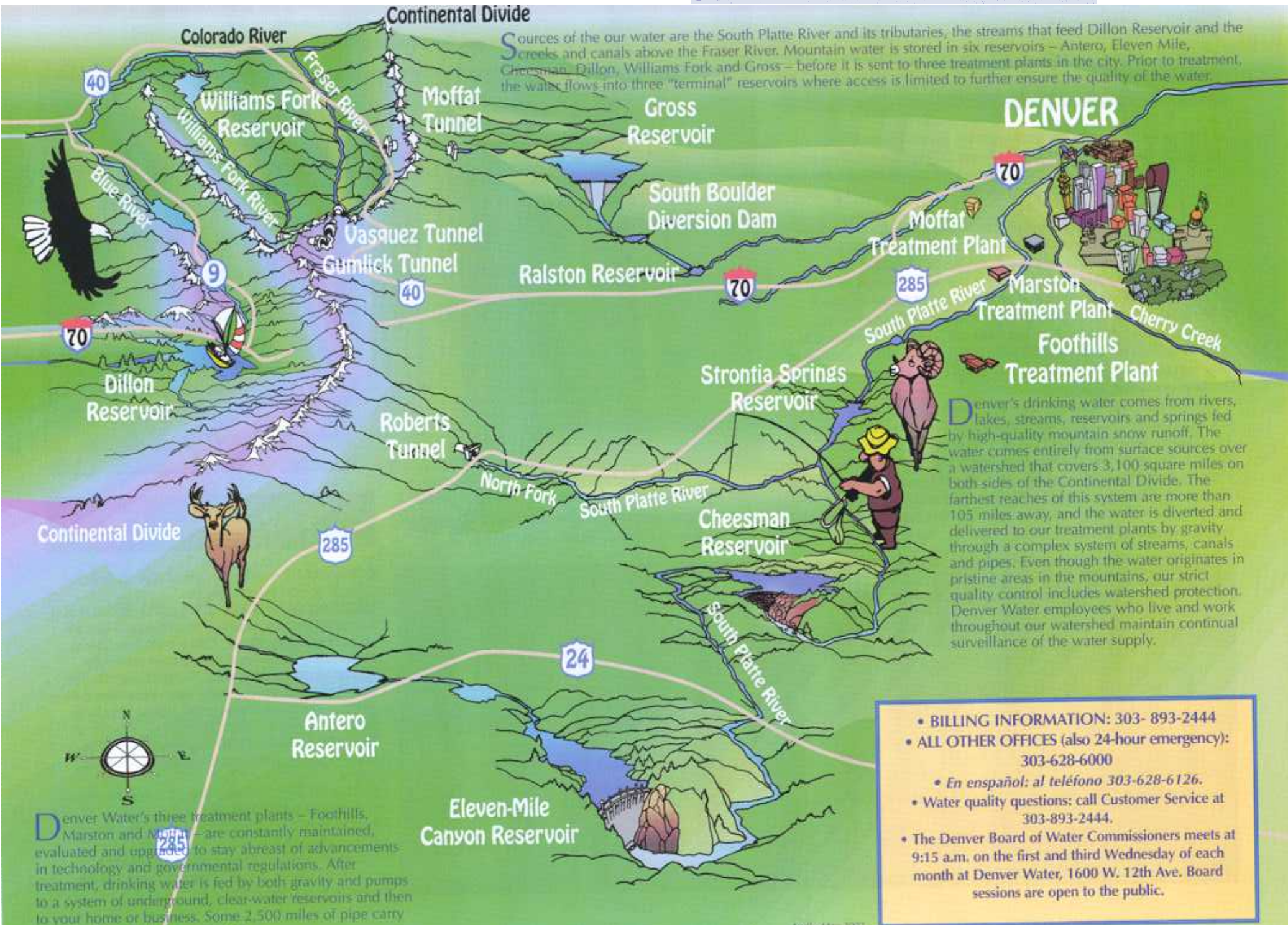
**2** ... That causes small particles to adhere to one another, making them heavy enough to settle into a basin from which sediment is removed. The water is then filtered through layers of fine, granulated material, either sand, coal or both, depending on the treatment plant. ...

**4** ... Denver Water carefully monitors the amount of chlorine added to maintain quality of water at the farthest reaches of the system. Fluoride occurs naturally but is also added to treated water, and pH is maintained by adding alkaline substances to reduce corrosion in the distribution system and your home or business.

**3** ... As smaller, suspended particles are removed, turbidity diminishes and clear water emerges. Finally, as protection against any bacteria and viruses that might remain, chlorine and ammonia are added before the water flows to underground reservoirs throughout the metro distribution system and into your home or business. ...



# Sources of Denver's Water



- **BILLING INFORMATION:** 303- 893-2444
- **ALL OTHER OFFICES** (also 24-hour emergency): 303-628-6000
- *En español:* al teléfono 303-628-6126.
- Water quality questions: call Customer Service at 303-893-2444.
- The Denver Board of Water Commissioners meets at 9:15 a.m. on the first and third Wednesday of each month at Denver Water, 1600 W. 12th Ave. Board sessions are open to the public.



# TREATED WATER QUALITY ROUNDUP

## Charting Quality

The Water Quality Lab at Marston, key to our quality assurance program, last year ran 39,859 tests from 11,788 samples while looking for more than 200 possible contaminants, many of which aren't regulated or detected. As the charts on this page reflect, very few of these substances were found in the city's treated water, all were well below allowed levels and none represents a health concern. For a full list of 2002 test results, call Maria Rose at 303-628-5996.

Colorado Public Water System  
I.D. No. 116001

## REGULATED AT THE TREATMENT PLANT

Substance	Violation	Sampling Period	MCLG*	MCL*	Denver Water's Average	Range of Detections	Sources of Substances
<i>Metals</i> <b>Barium</b> in parts per million (ppm)	No	Monthly	2	2	0.039	n/d <sup>1</sup> - 0.059	<i>Erosion of natural deposits; discharge of drilling wastes</i>
<i>Radiological</i> <b>Beta/photon emitters</b> in pCi/L <sup>2</sup>	No	Quarterly	0	4mrem/yr <sup>3</sup> Trigger Level 50	2	n/d - 4	<i>Decay of natural and man-made deposits</i>
<b>Uranium</b> in parts per billion (ppb)	No	Quarterly	n/a <sup>4</sup>	30 <sup>5</sup>	1.2	n/d - 12	<i>Erosion of natural deposits</i>
<i>Inorganics</i> <b>Fluoride</b> in ppm	No	6 times daily	4	4 <sup>6</sup>	0.87	0.13 - 1.45	<i>Erosion of natural deposits; water additive that promotes strong teeth</i>
<b>Nitrate</b> in ppm	No	Monthly	10	10	0.12	0.03 - 0.20	<i>Erosion of natural deposits; fertilizer; leaching from septic tanks, sewage</i>
<i>Disinfectant</i> <b>Chloramine</b> as Cl <sub>2</sub> in ppm	No	6 times daily	n/a	4 MRDL as Cl <sub>2</sub> <sup>7</sup>	1.42	0.98 - 2.03	<i>Drinking water disinfectant used to kill microbes</i>
<i>Organics</i> <b>Total Organic Carbon</b> as removal ratio	No	Running annual average	n/a	TT <sup>8</sup>	1.08	0.6 - 3.1	<i>Naturally present in the environment</i>

\*MCLG and MCL: Maximum Contaminant Level Goal and Maximum Contaminant Level. <sup>1</sup>Non-detect: Laboratory analysis indicates that the constituent was not present. <sup>2</sup>PicoCuries per liter. <sup>3</sup>Equivalent dose. <sup>4</sup>Not applicable. <sup>5</sup>Effective December 2003. <sup>6</sup>Two (2) is the Secondary Maximum Contaminant Level, which is not enforceable. Exceeding the Fluoride Secondary Maximum Contaminant Level of two micrograms

per liter triggers public notification. <sup>7</sup>Maximum Residual Disinfectant Level: highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants. <sup>8</sup>Treatment Technique: a required process intended to reduce the level of a contaminant in drinking water.

## UNREGULATED CONTAMINANTS<sup>1</sup>

Substance	MCLG	MCL	Denver's Water	Range of Detections	Sampling Period	Violation	Sources of Substances
<i>Organic Disinfection By-Products (DBPs)</i>			<i>Averages</i>				
<b>Bromodichloromethane</b> in ppb	n/a	n/a	13	1.9 - 16.3	Monthly	No	<i>Component of TTHM, by-product of drinking water chlorination (See chart below)</i>
<b>Bromoform</b> in ppb	n/a	n/a	1.4	n/d - 1.9	Monthly	No	
<b>Chlorodibromomethane</b> in ppb	n/a	n/a	2.5	n/d - 4.4	Monthly	No	
<b>Chloroform</b> in ppb	n/a	n/a	36.5	3.8 - 44.4	Monthly	No	
<b>Chloral hydrate</b> in ppb	n/a	n/a	2.4	0.7 - 4.1	Monthly	No	
<b>Chloropicrin</b> in ppb	n/a	n/a	n/d	n/d - 0.6	Twice Annually	No	<i>By-product of drinking water chlorination</i>
<b>Cyanogen chloride</b> in ppb	n/a	n/a	5.9	2.9 - 9	Annually	No	
<b>Haloacetonitriles (HAN)</b> in ppb	n/a	n/a	4	1 - 8.1	Twice Annually	No	
<b>Haloketones (HK)</b> in ppb	n/a	n/a	2.8	1.7 - 4.2	Twice Annually	No	
<b>Total organic halides (TOX)</b> in ppb	n/a	n/a	133	78 - 230	Annually	No	
<i>Inorganics</i>							
<b>Sulfate</b> in ppm	250	250 (SMCL) <sup>2</sup>	55	16.7 - 75.5	Monthly	No	<i>Naturally present in the environment</i>
<b>Sodium</b> in ppm	n/a	n/a	17.6	5.4 - 31	Monthly	No	

<sup>1</sup> Unregulated compounds are analyzed for consideration for future regulation. <sup>2</sup> Secondary Maximum Contaminant Level is a recommended level and is not enforceable. (The state health department has waived monitoring by Denver Water for asbestos, cyanide, dioxin and glyphosate.)

## Crypto & Giardia

Denver Water has tested for *Cryptosporidium* and *Giardia* in both raw and treated water for more than 15 years and has never detected a viable indication of either in drinking water.

Crypto and Giardia are microscopic organisms that, when ingested, can result in diarrhea, cramps, fever and other gastrointestinal symptoms. Crypto and Giardia must be ingested to cause disease, and they can be spread through means other than drinking water.

Most people readily recover from the symptoms, which can cause more serious illness in people with compromised immune systems. The organisms are in many of Colorado's rivers and streams and come from animal wastes in the watershed. Crypto and Giardia are removed by effective filtration at the plant. Disinfectants also kill Giardia.



## Upland Grassland

Denver Water always has been sensitive to condition of its watershed. Despite the impact of last year's disastrous wildfires and the state's historic drought, the department's approach endures that high quality runoff in the mountains adds up to supplies that are easier to treat in the city.

The inferno that swept through the South Platte River drainage and dry weather both have served to intensify our focus on watershed protection, particularly in the forest destroyed by the blaze at Cheesman Reservoir. Denver Water has allocated more than \$5 million for rehabilitation and erosion control in the scorched 7,000 acres surrounding the reservoir and dam. When work is complete, most of the incinerated trees will be gone, more than a quarter-million seedlings will be growing, the area will be planted in new vegetation, and what before was a well-tended forest will be an "upland grassland."

Immediately after the Hayman fire, Denver Water sent crews to the slopes surrounding Cheesman to build silt traps out of trees, branches and 30,000 bales of straw. A "leaky rock" sediment dam was constructed on Goose Creek and a similar one is planned on Turkey Creek. Charred trees are being mulched and some 220,000 pounds of grass seed have been spread. To counter the drought's low levels, Antero Reservoir was emptied last summer to keep Cheesman full enough to adequately dilute pollution from runoff.

## REGULATED AT THE CUSTOMER'S TAP

Substance	Violation	MCLG	Action Level <sup>1</sup>	No. Samples Exceeding AL	90th Percentile Value	Sampling Period	Sources of Substances
Inorganics <b>Lead</b> in ppb	No	0	At the 90th Percentile 15	1 out of 51	9	Annually	<i>Corrosion of household plumbing</i>
<b>Copper</b> in ppm	No	1.3	1.3	0 out of 51	0.19	Annually	

Lead isn't found in Denver's treated water. However, it might be present in a home's or business's plumbing. <sup>1</sup>Action Level: Concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

*Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home might be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you might wish to have your water*

*tested and to flush your tap for 30 seconds to two minutes before using tap water. (Always use cold tap water for food and beverage preparation. Hot tap water can leach higher amounts of lead and other metals from plumbing or hot water tank.) Additional information is available from the U.S. Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.*

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## The Glossary

**CONTAMINANT:** A potentially harmful physical, biological, chemical or radiological substance.

**MAXIMUM CONTAMINANT LEVEL (MCL):** Highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.

**MAXIMUM CONTAMINANT LEVEL GOAL (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**PARTS PER MILLION (PPM):** Equivalent to milligrams per liter. One ppm is comparable to one drop of water in 55 gallons.

**PARTS PER BILLION (PPB):** One ppb is equivalent to one drop of water in 55,000 gallons.

**PICOCURIES PER LITER (pCi/L) and 4MREM/YR:** Measures of radioactivity. (See below.)

**4MREM/YR:** Four millirem equivalent man/year. A maximum contaminant level standard based on dosage; about 50 pCi/L per liter.

## REGULATED IN THE DISTRIBUTION SYSTEM

Substance	Violation	MCLG	MCL	Denver's Water	Range of Detections	Sample Period	Sources of Substances
Organic Disinfection By-Products (DBPs) <b>Total Trihalomethanes<sup>1</sup></b> (TTHM) in ppb	No	0	80	Highest RAA <sup>2</sup> 27	11 - 62	Quarterly	<i>By-product of drinking water chlorination</i>
<b>Haloacetic acids</b> (HAA <sub>5</sub> ) in ppb	No	n/a	60	16	2.5 - 30	Quarterly	
Microbiological <b>Total Coliform</b> as Absent or Present	No	0	5% <sup>3</sup>	Highest monthly % 0.21% 1/02, 11/02	7 positive detects out of 6,378 samples, or 0.11%	Daily	<i>Naturally present in the environment</i>
<b>Turbidity<sup>3</sup></b> in Nephelometric Turbidity Units	No	n/a	TT	Highest Level/2002 0.17	Monthly samples less than 0.3 NTU 100%	12 times daily	<i>Soil runoff</i>

<sup>1</sup>Running Annual Average. <sup>2</sup>Total Trihalomethanes: By-products of the disinfection process. Some people who drink water that contains trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys or central nervous system.

and may have an increased risk of getting cancer. <sup>3</sup>Less than 5% positive in any month. <sup>3</sup>Turbidity has no known health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth.